

WHAT IS CLAIMED IS:

1. A flexible optical circuit comprising:
 - a. a partially flexible substrate, said partially flexible substrate further comprising a heating element for maintaining said flexible circuit at a constant temperature; and
 - b. a length of pre-fabricated optical fiber secured to said substrate.
2. The flexible optical circuit of Claim 1, wherein the partially flexible substrate further comprises temperature sensors.
3. The flexible optical circuit of Claim 2, wherein said temperature sensor is a thermistor.
4. The flexible optical circuit of Claim 2, wherein said temperature sensor is a thermocouple.
5. The flexible optical circuit of Claim 2, wherein said temperature sensor is a resistance temperature detector.
6. A flexible optical circuit resistant to variations in ambient temperature for use in an optical fiber amplifier comprising:
 - a. a partially flexible substrate, said partially flexible substrate having a first surface and a second surface and comprising a heating element; and
 - b. a first pre-fabricated optical fiber secured to said first surface.

7. The flexible optical circuit of Claim 6, further comprising a second pre-fabricated optical fiber secured to said first surface.
8. The flexible optical circuit of Claim 7, further comprising a third pre-fabricated optical fiber secured to said second surface.
9. The flexible optical circuit of Claim 6, further comprising a second pre-fabricated optical fiber secured to said second surface.
10. The flexible optical circuit of Claim 6, further comprising a temperature sensor embedded within said heating element.
11. The flexible optical circuit of Claim 10, further comprising a second pre-fabricated optical fiber secured to said first surface.
12. The flexible optical circuit of Claim 11, further comprising a third pre-fabricated optical fiber secured to said second surface.
13. The flexible optical circuit of Claim 10, further comprising a second pre-fabricated optical fiber secured to said second surface.
14. An optical fiber amplifier, said optical fiber amplifier comprising flexible optical circuit, said flexible optical circuit comprising:
 - a. a flexible heater circuit, said heater circuit comprising a heater element and having a first surface;

- b. a first length of pre-fabricated optical fiber secured to said first surface of said flexible heater circuit.
- 15. The optical fiber amplifier of Claim 14 wherein said flexible optical circuit further comprises a second length of pre-fabricated optical fiber secured to said first surface of said flexible heater circuit.
- 16. The optical fiber amplifier of Claim 14 wherein said flexible optical circuit further comprises a second length of pre-fabricated optical fiber secured to a second surface of said flexible heater circuit.
- 17. The optical fiber amplifier of Claim 14 wherein said heater circuit further comprises temperature sensors.
- 18. The optical fiber amplifier of Claim 17 wherein said flexible optical circuit further comprises a second length of pre-fabricated optical fiber secured to said first surface of said flexible heater circuit.
- 19. The optical fiber amplifier of Claim 18 wherein said flexible optical circuit further comprises a third length of pre-fabricated optical fiber secured to a second surface of said flexible heater circuit.
- 20. The optical fiber amplifier of Claim 17 wherein said flexible optical circuit further comprises a second length of pre-fabricated optical fiber secured to a second surface of said flexible heater circuit.

21. A method for fabricating a temperature-controlled flexible optical circuit comprising the steps of:
 - a. providing a partially flexible substrate, said partially flexible substrate including a flexible heater circuit;
 - b. obtaining a length of pre-fabricated optical fiber; and
 - c. securing said length of pre-fabricated optical fiber to said partially flexible substrate.
22. The method of Claim 21, wherein said flexible heater circuit further comprises a temperature sensor.
23. The method of Claim 22, wherein said temperature sensor is a resistance temperature detector.
24. The method of Claim 22, wherein said temperature sensor is a thermocouple.
25. The method of Claim 22, wherein said temperature sensor is a thermistor.
26. The method of Claim 21, further comprising the steps of:
 - a. obtaining a second length of pre-fabricated optical fiber; and
 - b. securing said second length of pre-fabricated optical fiber to said partially flexible substrate.

27. The method of Claim 26, wherein said partially flexible substrate has a first surface and a second surface, and wherein said second length of pre-fabricated optical fiber is secured to said second surface.
28. The method of Claim 27, wherein said flexible heater comprises a temperature sensor.
29. The method of Claim 28, wherein said temperature sensor is a resistance temperature detector.
30. The method of Claim 28, wherein said temperature sensor is a thermocouple.
31. The method of Claim 28, wherein said temperature sensor is thermistor.